DOCUMENT RESUME

ED 095 907 IR 001 090

AUTHOR	Lippey, Gerald
TITLE	Computer-Assisted Test Construction.
INSTITUTION	International Business Machines Corp., San Jose, Calif.
PUB DATE	74
NOTE	2p.; For related documents see IR 001 091 and 092
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	Computer Assisted Instruction; *Computer Oriented Programs; Computers; Individualized Instruction; *Individual Tests; *Item Banks; Item Sampling; Teachers; *Test Construction; Tests; Test Selection

ABSTRACT

Computer-assisted test construction is a simple, inexpensive natural complement to computer-based test scoring. Parallel tests can be made for individually-paced instruction, and the computer can produce feedback to improve item quality. The adaptability of computer-assisted test construction means that its introduction will likely be accepted by teachers who fear programs that make instructional decisions. Eventually it can lead to more sophisticated computer-augmented instructional approaches. (WH)

ED 095907

COMPUTER-ASSISTED TEST CONSTRUCTION

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

Gerald Lippey
IBM Corporation
San Jose, California

A new instructional support application that shows signs of widespread appeal is the use of computers to assist in the preparation of tests. The author is presently aware of over 60 different computer-based test construction systems, and several of these are in use at more than one institution.

The systems referred to here are not those in which the test is administered by a computer. All author languages for interactive instructional (or "CAI") systems provide the ability to dynamically assign questions based on previous responses. (In fact, the so-called "drill and practice" mode does precisely this.) By contrast, the systems discussed here involve a far less sophisticated approach: a test is produced on paper to be administered at a later time.

Most of these systems make use of a bank of test items in machine-readable form to print questions on demand. Many include computer assistance in selecting the specific questions to be printed. Some systems can generate a large number of similar questions by using random techniques to particularize a question "skeleton." A few involve computer assistance in the item selection step only, with the items drawn manually from files and the tests printed by conventional means.

There appear to be several hundred machine-readable question data banks at this time, and many more are under development. In public schools, item collections generally are prepared for mathematics, social studies, science, and language arts. Popular subject matter areas at the college level are psychology and the physical sciences. Item banks vary in size from a few hundred questions to many thousands, with the median size apparently around a thousand items.

In contrast to on-line testing, which generally grows out of work in the CAI area, computer-assisted test construction seems to be evolving as an adjunct to computer-based test scoring. It also appears to be emerging closer to the traditional instructional setting. In most cases, the driving force behind the application has been a classroom instructor who is anxious to improve his methods of operation, rather than a professional innovator experienced in applying computer technology to education.

There are many benefits realized by those who use the computer to store and fetch questions. Perhaps the most significant ones stem from the fact that the items exist in a centralized bank.

TM001090

Because many users can share a single collection, all of the efficiencies of specialization accrue. Teachers may have convenient access to each other's questions. Item quality can easily be improved as feedback is obtained. Clerical work associated with preparing error-free tests and exercises is, of course, reduced. Of particular importance in individually-paced instruction, systems can be designed to produce a parallel test when needed. Thus, if sufficient items are available, no single test needs to be protected after it has been administered.

When compared to other uses of a computer in support of instruction, a few additional advantages become apparent. Most important, the cost of implementing and operating such an activity is very low. Small computers and batch processing environments are usually adequate. Furthermore, this application need not force change in the educational environment. It can support almost any teaching style. It can be offered as a service which any instructor can elect to use or not as he sees fit. It can operate entirely under a teacher's control, supporting him rather than imposing structure. Thus, it may be regarded by teachers as less threatening than applications containing built-in instructional decisions.

On the other hand, computer assistance in test construction is a potential component of more sophisticated computer-augmented approaches. Some of the existing automated test preparation activities are, in fact, parts of larger computer-managed instruction systems. These more extensive systems usually include instructional decision-making elements, such as diagnosis of learner difficulties and prescription of assignments. A test construction application can, therefore, stand alone under instructor control or fit into an integrated computer-managed instruction system. For this reason, those who wish to begin with a small, simple system and grow toward a more comprehensive system may find test construction a convenient starting point.

Readers who wish to learn more about this application will find 22 articles describing 19 different systems in the March 1973 issue of Educational Technology magazine.